

Required Information, Tools and Routine Maintenance



This STAT/M service manual was created to act as reference for the service and repair of the STAT/M brand. In the interest of providing one comprehensive global service manual, this book references numerous STAT/M units that are sold in various markets and in different geographic locations around the globe. Because of this, you will note that there are chapters and sections that do not apply to the STAT/M unit that you may have, or are repairing.

If you have a question about the unit you are repairing, please do not hesitate to contact your local SciCan representative for confirmation.



Hazardous voltages are accessible when the cover is removed. Disconnect the power cord before servicing the power mains portion of the controller board and associated devices.



A dielectric strength test (Hi-Pot) must be performed on the STAT/M if parts associated with the mains portion of the controller board are serviced or replaced.



A protective bonding impedance test (ground continuity) must be performed on the STAT/M if components of the protective earthing system are changed or connections broken and remade.



The STAT/M is heavy. Exercise caution and seek assistance when lifting or carrying the units. Use only steam-process distilled water in the STAT/M.



The STAT/M contains electronic circuitry that is static sensitive. Always wear a static strap when working with or near printed wiring boards. In addition, use static footstraps, grounding mats and grounded work surfaces when servicing microprocessor devices. Transport boards and devices in static protected bags.



Always prime the pump to avoid Steam Generator and Thermal Fuse damage. Never assume that the pump is primed.

Ensure that there is sufficient steam-process distilled water in the STAT/M before activating the pump.

Before a STAT/M can be serviced the following special tools will be required in addition to your service tool kit. These tools are available from SciCan or your nearest service depot:

- | | |
|-----------------------|-------------------|
| 1. Control Box SciCan | Part # 01-103141S |
| 2. Pump Tester SciCan | Part # 01-100713S |

Required Information, Tools and Routine Maintenance

3. Water Conductivity Tester SciCan Part # 01-103139S
4. Solenoid Plunger Tube Wrench SciCan Part # 01-103471S
5. 9/64" ball-end allen-key (hex) screwdriver SciCan Part # 01-103469S
6. Calibration Cassette with Detachable SciCan Thermocouple* and Digital Thermometer* Part # 01-03664S
7. Calibration Cassette SciCan, 5000S Part # 01-106637S
8. Thermocouple* and Digital Thermometer* SciCan Part # 01-103090S
9. Digital Voltmeter accurate to + 0.001 Volt
10. Hi-Pot Tester
11. Ground Continuity Tester
12. Static Strap
13. Static Bags
14. HEISE LCD Digital Indicator Type ST-2H from Dresser Instrument
Items 1-8 are available from SciCan.

(* - the Detachable Thermocouple and Thermometer are always serial number matched together in a kit. Both must be calibrated together every six months by a quality calibration service bureau or SciCan. This applies to non S units only).

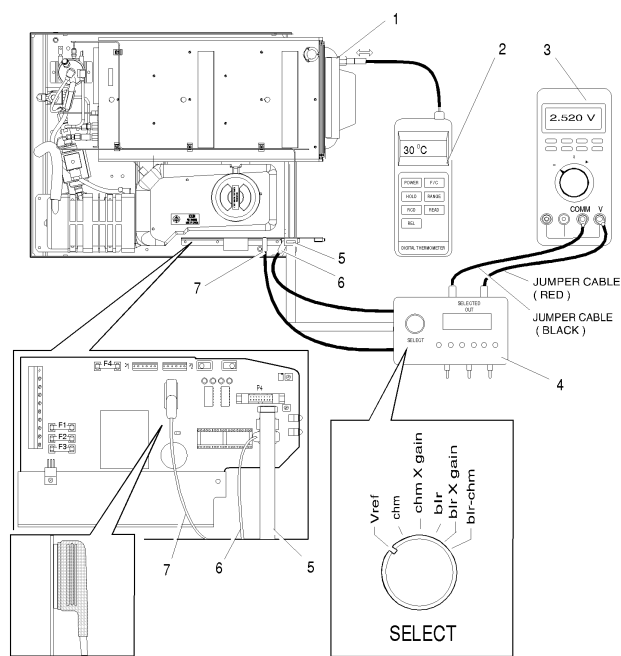
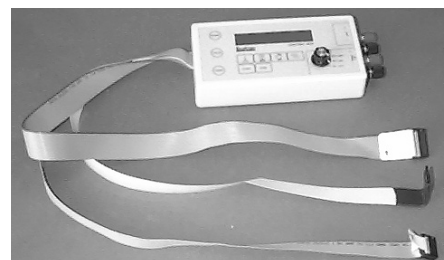


Figure 1 (for non S units only)



1. Calibration cassette with detachable thermocouple
2. Digital thermometer
3. Digital voltmeter
4. Control box
5. 2x7 ribbon cable, LCD connector (connect to Controller Board header P3)
6. 1x7 cable, keypad connector (connect to Controller Board header P4)
7. 2x10 moulded socket, test connector (connect to Controller Board Header P1)

Required Information, Tools and Routine Maintenance

The Control Box

When connecting the Control Box connectors to the Controller Board note the positions of Pin #1 of the Control Box test connectors and Pin #1 of the Controller Board headers.

There are two kinds of Control Boxes that you may encounter: one utilizes toggle switches (shown in Figure 1), the other uses a membrane keypad arrangement similar to the keypad on the unit.

The Control Box (4) is a service tool that allows a technician to operate the unit while it is being serviced. The Control Box has a display (LCD) and a variety of control switches which allow the technician to:

1. Operate the unit independently of the keypad mechanism, to manually activate the pump, valve or compressor, or run cycles.
2. Make frequently used Controller Board measurements by providing a common output and rotary switch for signal selection during calibration. See the Calibration Instructions in your Service Manual.

If only the display and button functions are being used, connect the LCD cable (5) to Controller Board connector P3, the keypad cable (6) to Controller Board connector P4 and power the Statim **ON**.

If the override or measurement functions are being used, connect the 2x10 cable (7) to connector P1 of the Controller Board in addition to the other cables (5 and 6).

When using a toggle switch model of the Control Box, turn the switch to the **ON** position to activate the desired device. To turn the device **OFF** turn the switch to the **AUTO** position. To select, start and / or stop a cycle, activate the appropriate push-button switch on top of the Control Box. Calibration utilizes the Select out +, Select out - jacks and a setting on the Rotary Switch to set the calibration operation desired for Type A Controller Boards. See *Thermocouple Calibration*.

When using a keypad model of the Control Box, the keypad switch must be held down to turn the desired device **ON**. Vref measurements utilize test leads, the Vref + and Vref - banana jacks and a voltmeter hooked up in series. Calibration utilizes the Select out + and Select out - jacks, test leads and a setting on the Rotary Switch to set the calibration operation desired for Type A Controller Boards.

Required Information, Tools and Routine Maintenance

The keypad of this Control Box provides the same features as a STAT/M keypad. See *Thermocouple Calibration*.

The Control Box is for use with STAT/M products ONLY.

Preventative Maintenance Schedules

To ensure trouble-free performance, both the operator and the dealer must follow a preventative maintenance schedule.

Operator		
Daily	Cassette	Wash the interior of the cassette with chlorine-free dishwashing detergent or soap. Rinse thoroughly with water.
	Water Reservoir	Drain Daily
	Waste Bottle	Empty the waste bottle every time you refill the reservoir. Fill with tap water up to MIN line. You can also add some chlorine-free disinfectant.
Weekly	Air Filter	Check the air filter for dirt and moisture. Replace if dirty. Call for service if wet.
	Biological Air Filter	Check the air filter for dirt and moisture. Replace if dirty. Call for service if wet.
Every six months	Air Filter	Replace every 500 cycles or six months (whichever comes first).
	Biological Air Filter	Replace every 500 cycles or six months (whichever comes first).
	Cassette Seal	Replace every 500 cycles or six months (whichever comes first).

Required Information, Tools and Routine Maintenance

Technician		
Once a Year	Cassette	Check the tray, lid and seal for damage. Replace if necessary.
	Air Filters	Check the filters. Replace if dirty.
	Solenoid Valve	Inspect the valve and clean if dirty. Replace the plunger if defective.
	Pump	Clean the filters, replace if dirty.
	Check Valve	Remove the air compressor tube from the check valve inlet while running a cycle. Make sure no steam is leaking from the valve. Replace if there are any leaks.
	Solenoid Valve	Inspect the valve and clean if dirty. Replace the plunger if defective.
	Water Reservoir	Check the reservoir for dirt. Clean and rinse with steam process distilled water if necessary.
	Calibration	Calibrate the unit.

Cleaning the Cassette

Keeping the STAT/ML cassette clean is good clinical practice and assists in the function of the unit. SciCan recommends that the interior surface be cleaned at least once a week. Use dishwashing soap or a mild detergent that does not contain chlorine. Scrub the inside of the cassette with a cleaning pad designed for use with Teflon™ coated surfaces. After scouring, rinse thoroughly with water to remove all traces of the detergent. Cleaning the inside of your cassette is very important if you regularly sterilize lubricated instruments. Coating the entire inside surface with STAT-DRI drying agent induces water to form an even coat on the inside surface, without beading. The water in contact with the hot cassette surfaces also evaporates much more efficiently. Spotting is minimized and instruments dry much better. STAT-DRI should be applied every 10 cycles, and after every cassette cleaning.

STAT-DRI is available from SciCan in a 2 ounce bottle (SciCan Part # 2OZ473) or an 8 ounce bottle (SciCan Part #8OZ473).

Required Information, Tools and Routine Maintenance

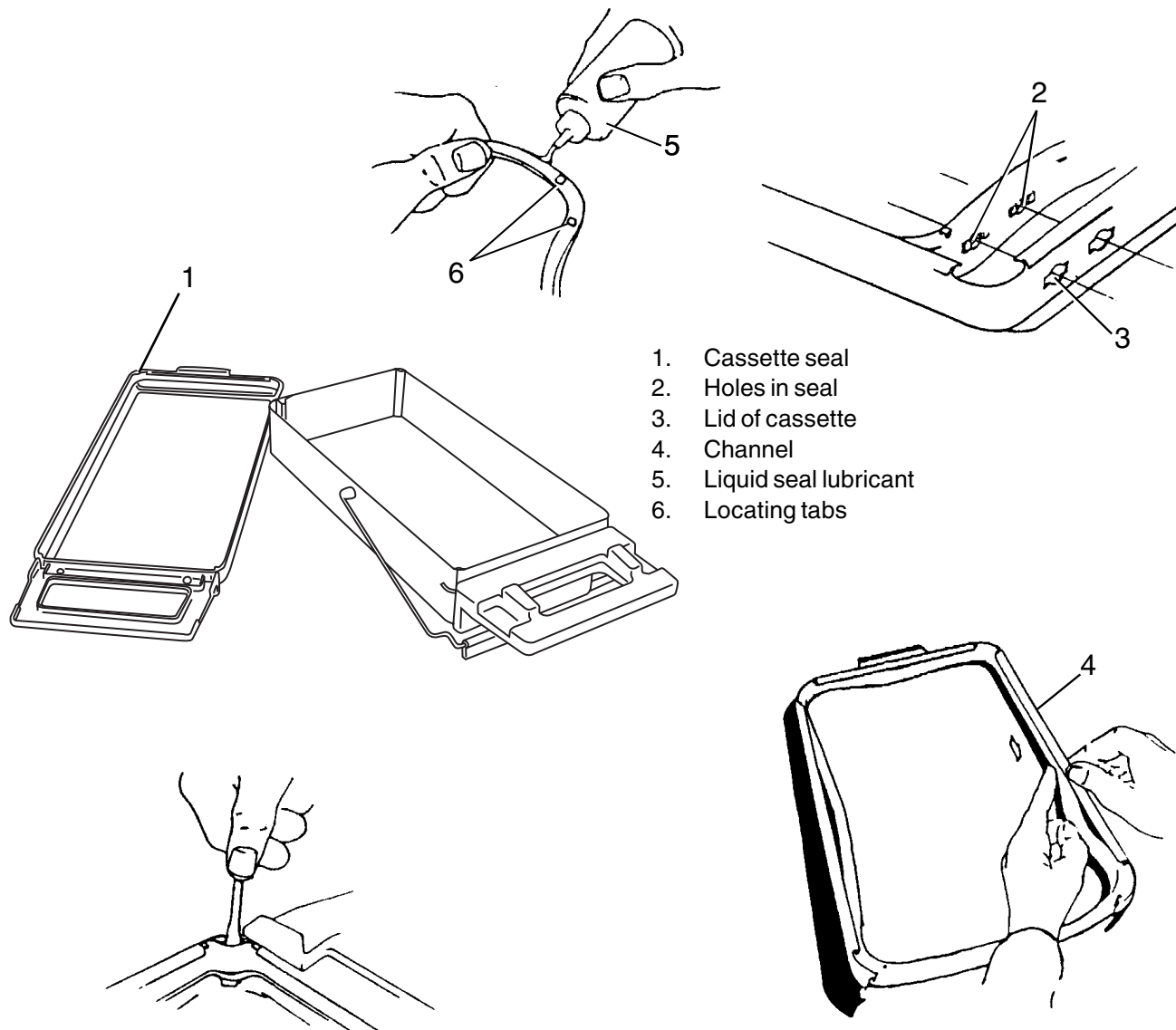


Figure 3

Required Information, Tools and Routine Maintenance

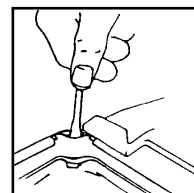
Replacing the Cassette Seal

To ensure optimum performance of your STAT/M cassette autoclave, change the cassette seal every 500 cycles or every six months, whichever comes first. Replacement seals are available from SciCan (order number 01-101649S for STAT/M 5000S).

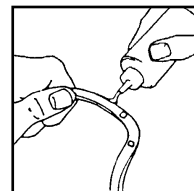
To change the cassette seal, follow these steps:(see Figures 3, 4)

Place the cassette lid and the new seal on a clean work surface. Examine the position of the old seal in the cassette lid and arrange the new seal in the same orientation, next to the lid.

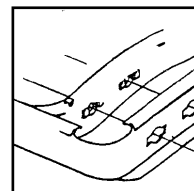
Remove the old seal and discard. Clean any residue out of the seal channel and flush out the channel with distilled water.



Lubricate the new seal with the liquid seal lubricant provided.



Insert the rounded edge of the seal under the round lip of the lid. Align the holes in the new seal with the holes in the lid.



NOTE: At every corner, two square nibs should be visible.

Ensure the seal is completely inserted. Feel around the periphery to ensure the seal is securely in place.

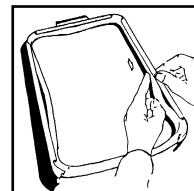


Figure 4

NOTE: During a cycle, steam may appear between the lid and the tray.

Be careful. The metal parts will be hot, and the cassette may contain hot steam.



Required Information, Tools and Routine Maintenance

Cleaning the Enclosure

Use a soft cloth moistened with a mild cleaning solution or a mild Disinfectant to clean all outside surfaces. Do not use solvents or harsh chemicals.

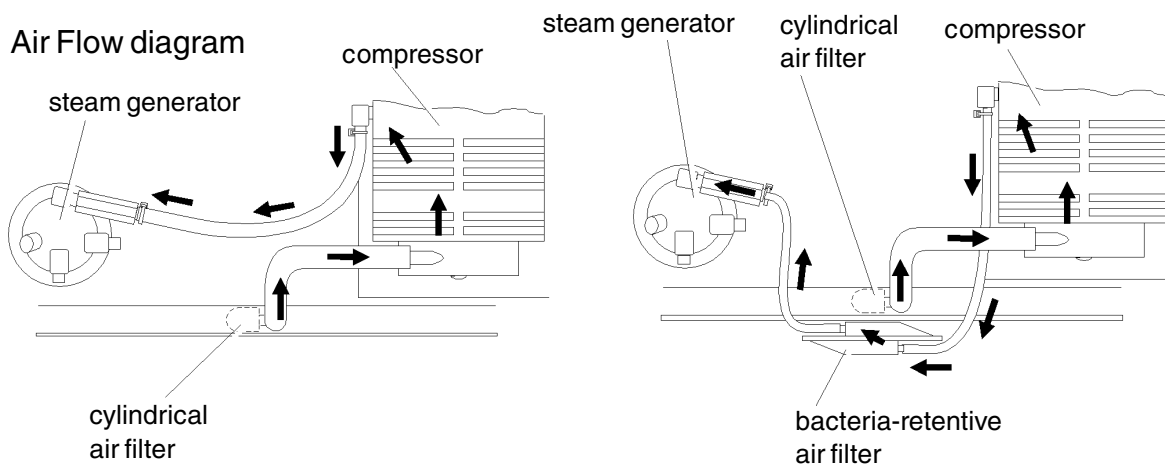


Figure 5

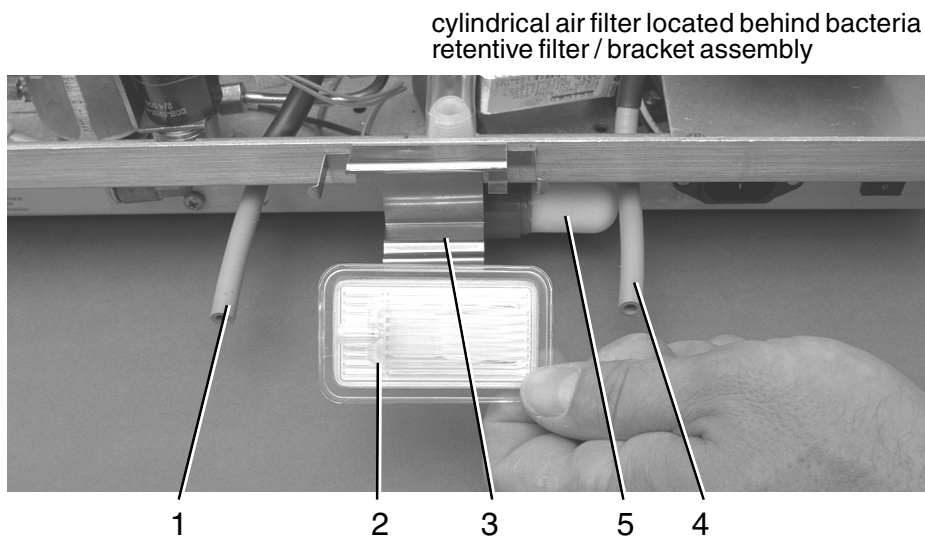


Figure 6

1. tube A
2. bacteria-retentive air filter
3. filter bracket
4. tube B
5. cylindrical air filter

Required Information, Tools and Routine Maintenance



Air Filters – STAT/M 5000 / 5000S

Never re-use an old filter. Never run the unit without a clean filter in place.

After each sterilization cycle the compressor forces air through the cassette to rid it of steam and to dry the instruments. The air is drawn into the Compressor (see Figure 5) through one or two filters located at the back of the unit, depending upon which unit is being serviced. The STAT/M units draw air through a circular air filter located behind the cover plate on the Compressor, at the rear of the unit. The STAT/M is manufactured with an additional bacteria-retentive air filter, held in a bracket, attached to the rear cover of the unit. (See STAT/M Cover Removal and Replacement). Filters should be changed every 500 cycles or six months (whichever comes first).

Cylindrical Air Filter and Bacteria-Retentive Filter

To change both filters, follow these steps (see Figure 6):

1. Disconnect tube A (1) from the bacteria-retentive filter (2) and remove the filter from the filter bracket (3). As you remove the filter from the bracket, note the orientation of the arrow mark on the filter.
2. When the filter is free of the bracket, carefully disconnect tube B (4) from the filter. Do not pull on this tube.
3. Unscrew the cylindrical air filter (5). Discard the old filter.
4. Screw the new filter, finger tight only, into place.
5. Before installing the replacement bacteria-retentive filter check that the arrow mark on the filter matches the direction of the arrow on the bracket. Push the left hand filter fitting into tube B (4).
6. Gently press the replacement filter into the filter bracket. The arrow mark on the filter is facing out and pointing to the left.
7. Re-connect the tube A (1) to the right hand filter fitting.

Cylindrical Air Filter Only

To change the cylindrical air filter only, follow these steps (see Figure 6):

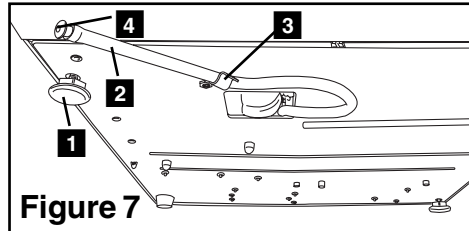
1. Unscrew the cylindrical air filter (5) in a counter clock-wise direction.

Required Information, Tools and Routine Maintenance

2. Discard the old filter.
3. Screw the new filter, finger tight only, into place.

Draining the Reservoir

If you must service the reservoir, ship the Statim, or move the unit more than a short distance, follow these directions:



1. To drain the water from the reservoir, carefully move the STAT/M to the edge of the work surface. The front leveler feet (1) should be approximately 12 mm (1/2 inch) from the edge so the unit remains securely seated on the work surface.
2. Lift the front left corner of the STAT/M upward and remove the drain tube (2) from the clip (3) located on the underside of the unit. Gently pull the tube out as far as possible so the free end can be positioned over a container when the unit is lowered back to the work surface.
3. Remove the stopper (4) from the end of the drain tube and allow the water to drain from the reservoir. When water no longer drips from the drain tube, replace the stopper.
4. Lift the front left corner of the Statim upward and re-insert the tube into the clip on the underside of the unit. Push the excess length of tubing back from where it came.

Shipping the STAT/M

If you must ship the STAT/M, follow these directions:

1. Drain the reservoir. See, *Draining the Reservoir*.
2. Screw in each leveler foot completely.
3. Repack your STAT/M in the original packing materials.
4. Specify heated and insured shipping.

Required Information, Tools and Routine Maintenance

Safety Compliance

When a STAT/ML is serviced, the safety criteria as specified by applicable international safety standards and applicable national, state, provincial, and regional laws and regulations must be observed and maintained.



Dielectric Strength Test (Hi-Pot)

Exercise caution while performing this test. Hazardous voltages are present. Do not touch the unit, nor allow the unit to touch any conductive surfaces during the test.

When components of the mains part are serviced or replaced, the dielectric strength of the electrical insulation between the mains and user-accessible conductive parts must be tested to ensure continued compliance of the unit with applicable international safety standards.

Perform the test using a dielectric strength (hi-pot) tester operated in accordance with the manufacturer's written instructions using the following parameters:

Test Voltage: 1500Vac RMS

Test Voltage Frequency: 50 or 60 Hz

Test Voltage Rise Time: 2 seconds (maximum)

Duration at Test Voltage: 2 seconds (minimum)

Connection Points:

- a. Unit chassis
- b. Line and neutral terminals of the mains plug connected together.



For the unit being tested to pass, there must be no breakdown of the Insulation nor any flashover.

Protective Bonding Impedance Test (Ground Continuity)

Applicable international safety standards require that the impedance between the protective conductor terminal of the power entry connector and any user-accessible conductive parts not exceed 0.1 ohms. If any components of the protective earthing system are changed or any connections of that system are broken and remade, the impedance of

Required Information, Tools and Routine Maintenance

the Protective bonding must be tested and verified as being less than 0.1 ohms Using test equipment and procedures in compliance with applicable International safety standards and national, state, provincial, and regional Laws and regulations.

Chamber Temperature Mapping

Test outcomes have found the highest temperature spot in the 5000S cassette chamber is located in the UPPER / RIGHT / FRONT corner and the lowest temperature spot is located at the UPPER / RIGHT / REAR of the cassette on the right side.

Water Conductivity Testing

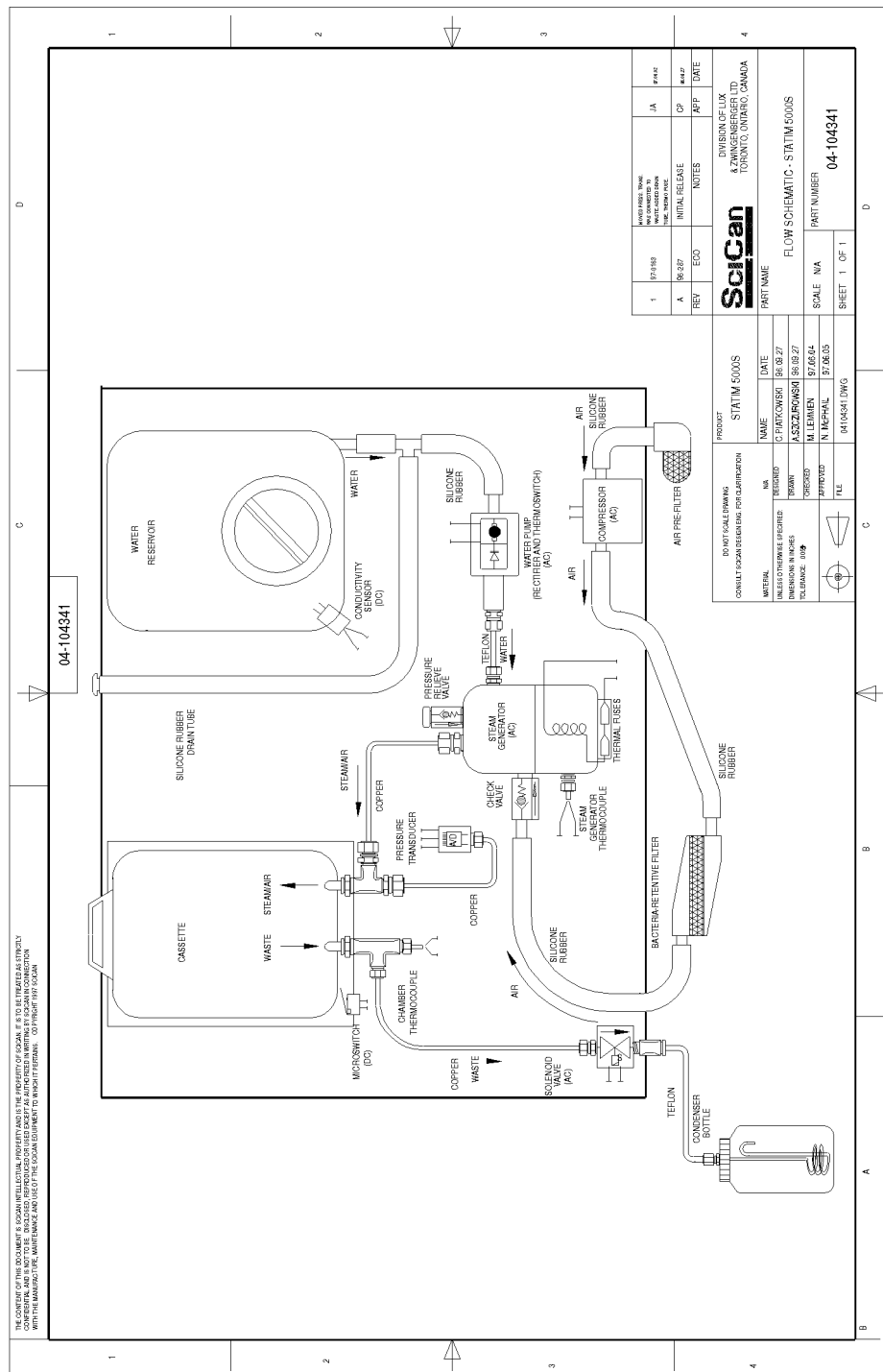
Water conductivity testing determines the amount of dissolved solids in the steam-process distilled water used in the STAT/M unit. Use only steam-process distilled water having 5 ppm or less dissolved solids or a conductivity of less than 10 $\mu\text{S} / \text{cm}$. Follow the manufacturer's instructions to test water conductivity using SciCan conductivity meter, part #01-103139S, or any other equivalent meter.

Temperature has a significant effect on conductivity readings, therefore the water being tested should be at room temperature.

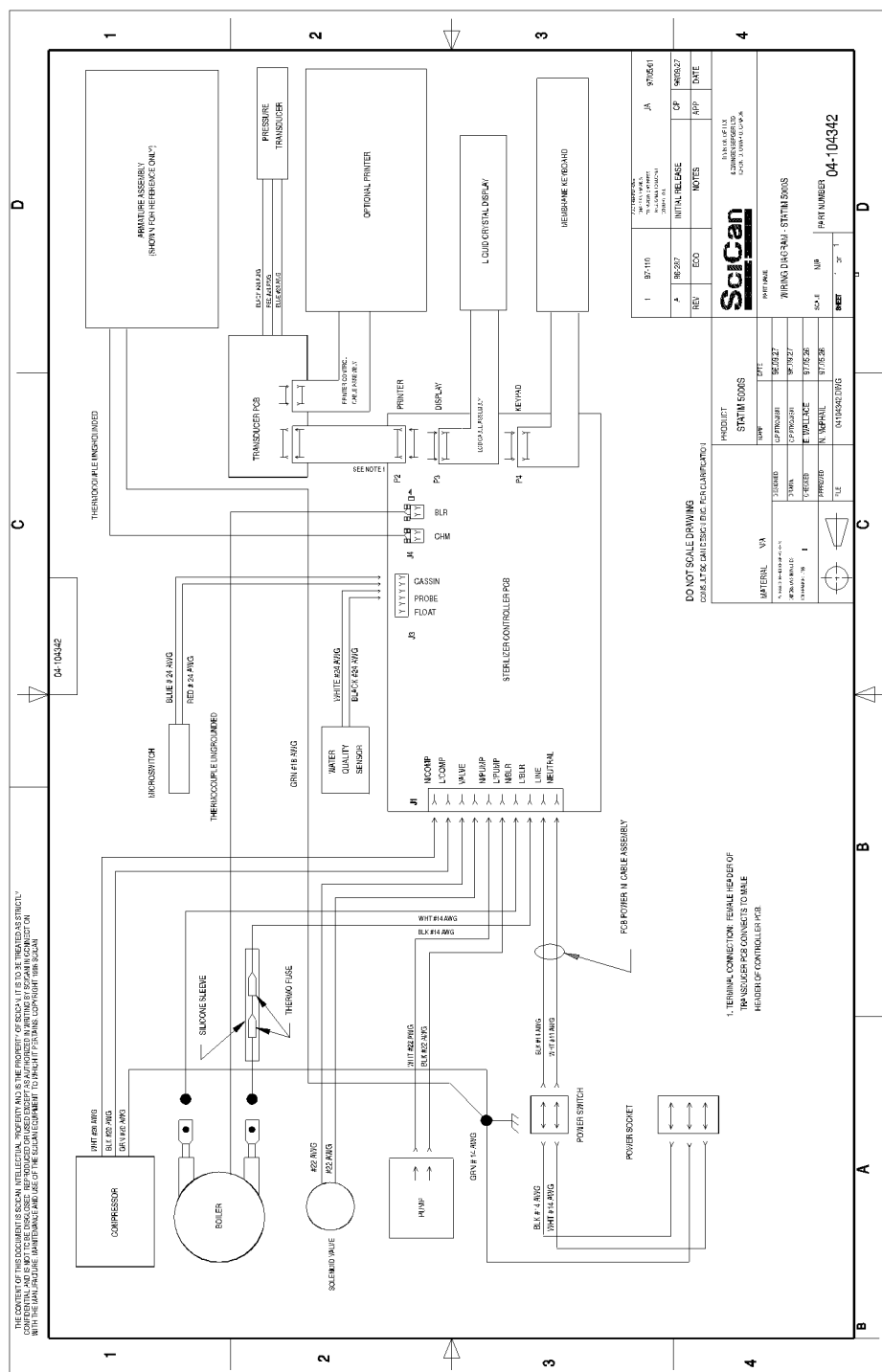


Water Conductivity
Measurement

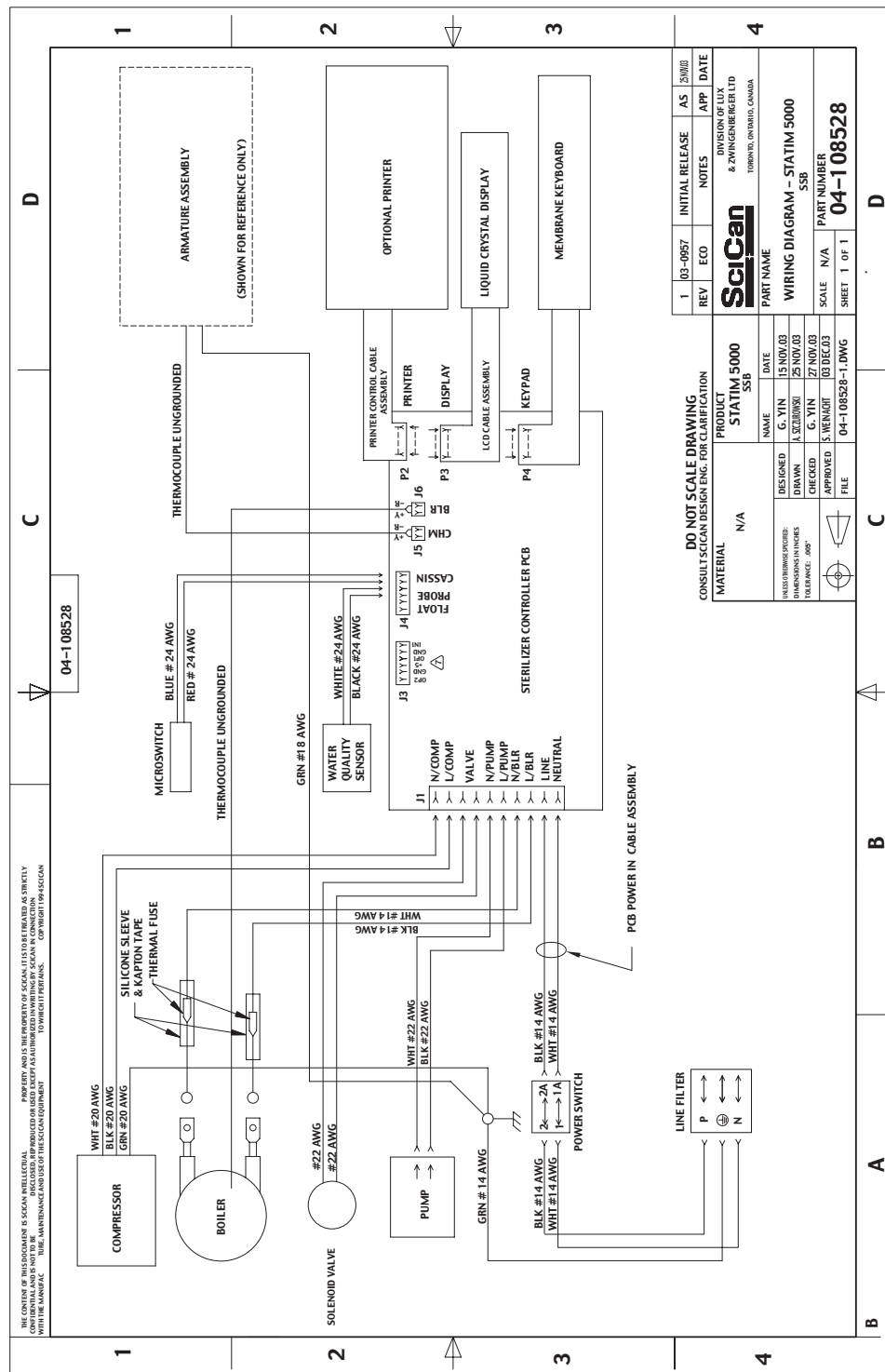
Required Information, Tools and Routine Maintenance



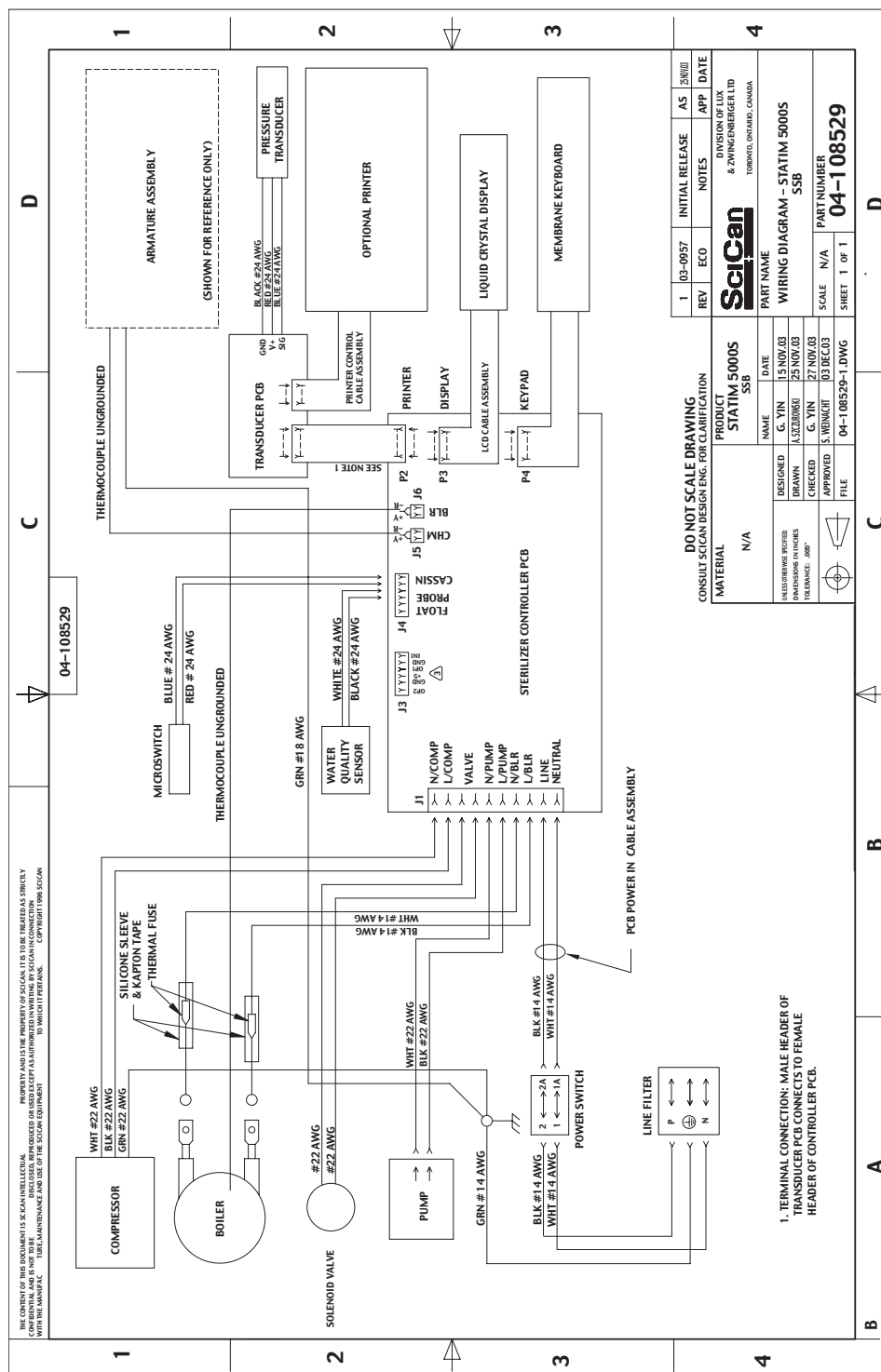
Required Information, Tools and Routine Maintenance



Required Information, Tools and Routine Maintenance



Required Information, Tools and Routine Maintenance



Document Change Record

Document 96-103913		Title: Required Information and Tools	
Revision	ECO	Notes	Date
4.0	04-0020	Updated chapter as per prEN13060 requirements.	January 16, 2004
3.0	99-0059	Added 5000S references. Added Flow Schematic and wiring 99-0059 diagram	April 14, 1999
2.0	98-0290	Line art replaced with photos. Image of keypad style control box added. Cassettes added. 5000S references added. Calibration cassette Pressure fitting added. Added reference to EN 61010 and changed Hi-Pot test voltages.	January 24, 1998
1.0	96-088	Initial Release	May 29, 1996